



Supplement of

The application of biochar and oyster shell reduced cadmium uptake by crops and modified soil fertility and enzyme activities in contaminated soil

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Table S1 The main characteristics of soil and amendments.

Properties	Soil		Biochar	Oyster shell
	2019	2020		
pH	5.54 ± 0.23	5.27 ± 0.18	8.22 ± 0.06	8.52 ± 0.32
Cation exchange capacity (CEC, cmol/kg)	14.92 ± 0.62	15.21 ± 0.54	3.53 ± 0.11	1.32 ± 0.08
OM (g/kg)	39.32 ± 2.34	43.47 ± 2.12	541.53 ± 11.73	12.60 ± 1.21
Total N (g/kg)	2.28 ± 0.39	2.31 ± 0.24	0.48 ± 0.06	1.42 ± 0.10
Total P (g/kg)	0.69 ± 0.07	0.65 ± 0.04	2.28 ± 0.32	0.60 ± 0.03
Total K (g/kg)	17.70 ± 1.35	17.81 ± 2.11	26.40 ± 0.92	2.00 ± 0.32
C (%)	1.56 ± 0.21	1.53 ± 0.34	92.50 ± 4.52	15.72 ± 1.06
Total Cd (mg/kg)	1.60 ± 0.10	1.62 ± 0.07	0.05 ± 0.01	0.12 ± 0.03

Table S2 The main composition of oyster shell.

Main compounds	Al ₂ O ₃ (%)	CaCO ₃ (%)	MgO (%)	Na ₂ O (%)	P ₂ O ₅ (%)	SiO ₂ (%)
Values	0.40	95.5	0.62	1.02	0.4	0.82

Table S3 The effects of amendments on soil nutrients.

Treatments		TOC (%)	OM (g/kg)	Olsen-P (mg/kg)	Olsen-K (mg/kg)	Alkeline-N (mg/kg)
Rice planting	PA0	2.28 ± 0.17a	39.32 ± 3.04a	12.44 ± 0.96a	135.65 ± 13.65a	158.00 ± 7.28a
	PA1	2.39 ± 0.09a	41.30 ± 1.55a	11.62 ± 1.38a	165.40 ± 18.77b	165.20 ± 6.53a
	PA2	2.30 ± 0.06a	40.36 ± 2.35a	37.44 ± 9.50b	166.40 ± 18.55b	167.00 ± 7.17a
	PA3	2.51 ± 0.30a	43.22 ± 3.47a	35.76 ± 6.45b	176.00 ± 9.05b	167.00 ± 17.24a
Oilseed rape planting	PA0	2.35 ± 0.08a	40.44 ± 0.82a	9.32 ± 0.39a	154.00 ± 13.80a	156.20 ± 8.93a
	PA1	2.61 ± 0.16a	45.02 ± 2.74a	9.10 ± 0.82a	166.60 ± 30.05a	163.60 ± 15.77a
	PA2	2.44 ± 0.07a	42.10 ± 1.38a	36.90 ± 6.32b	163.30 ± 19.70a	164.60 ± 4.10a
	PA3	2.47 ± 0.28a	42.68 ± 4.93a	35.42 ± 7.54b	156.00 ± 18.97a	163.60 ± 18.24a

Market price of amendments

(1) Biochar price

A: 600 USD t⁻¹

<https://detail.1688.com/offer/606079279556.html?spm=a26352.13672862.offerlist.6.50ef7c66Do04c1>

B: 540 USD t⁻¹

https://s.1688.com/selloffer/similar_search.html?spm=a26352.13672862.offerlist.222.50ef7c66Do04c1&offerIds=611149343926&imageAddress=https%3A%2F%2Fcbu01.alicdn.com%2Fimg%2Fibank%2F2018%2F685%2F314%2F9229413586_1370517944.jpg&scene=similar_search&postCatPaths=1034839%2010373%208&sameDesignEnable=false

C: 180 USD t⁻¹

<https://detail.1688.com/offer/642635366559.html?spm=a26352.13672862.offerlist.14.50ef7c66Do04c1&tracelog=p4p&clickid=15069b95b2fd456980b4b8ef112b4a89&sessionid=644c22d484681bf74c6513e9617bd9fc>

(2) Oyster shell powder

A: 75 USD t⁻¹

<https://detail.1688.com/offer/531648790633.html?spm=a26352.13672862.offerlist.38.35e42e726axM8V&tracelog=p4p&clickid=56cb1a130b3048569171c5e566418f30&sessionid=8dc02f341b05df19ff916d7d13e90c7d>

B: 75 USD t⁻¹

<https://detail.1688.com/offer/630952510546.html?spm=a26352.13672862.offerlist.81.18562e721pCSYZ>